Caulking and Weatherstripping

Introduction

Your home loses heat by transmission and by air leakage. Transmission loss occurs by conduction, radiation and convection of heat through walls, ceilings or floors and can be controlled by insulation.

Loss of heat also occurs when warm air leaks out and cold air leaks in. Caulking and weatherstripping are materials designed to stop these leakage losses.

Air leakage can account for one-third of the total heat loss in an average home. Warmed air leaking out must be replaced with cold air drawn in, and then heated. Excessive air leakage may cost $100 to $150 each year if heating is with natural gas - more with other fuels. Moisture also escapes with the warm air, and if it condenses inside the walls or attic, serious structural damage can result.

Common sources of air leakage are shown in Figure 1. If all the small cracks and holes are added up they can be equal to a hole 300 mm (12 inches) square. This is like leaving a small window open all winter!

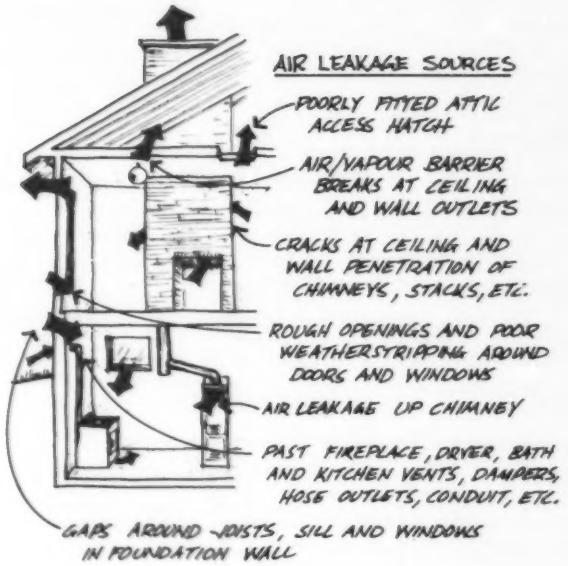

AIR LEAKAGE SOURCES
POORLY FITTED ATTIC ACCESS HATCH
AIR/VAPOUR BARRIER BREAKS AT CEILING AND WALL OUTLETS
CRACKS AT CEILING AND WALL PENETRATION OF CHIMNEYS, STACKS, ETC.
ROUGH OPENINGS AND POOR WEATHERSTRIPPING AROUND DOORS AND WINDOWS
AIR LEAKAGE UP CHIMNEY
PAST FIREPLACE, DRYER, BATH AND KITCHEN VENTS, DAMPERS, HOSE OUTLETS, CONDUIT, ETC.
GAPS AROUND JOISTS, SILL AND WINDOWS IN FOUNDATION WALL

Figure 1

Caulking and weatherstripping materials to cut air leakage heat losses by at least one-third can be purchased for $200 to $300.

Weatherstripping

Weatherstripping can control air leakage where two surfaces meet and move relative to each other, such as windows and doors (Figure 2). Weatherstripping is the easiest and least costly way to control heat loss by air leakage and improves comfort by eliminating drafts.

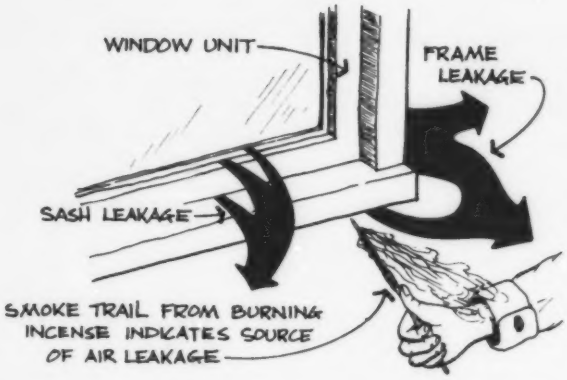


Figure 2

The first step is to determine where the air is leaking. Leakages can be detected by holding a smoking "draft indicator" near doors, windows and vents. The smoke follows the air currents and locates the draft. Simple indicators are:

- a smouldering piece of cotton string
- smoke from an incense stick or "smoke pencil", a commercially available smoke-generating device.

Air leakage is easier to detect when the air pressure difference between inside and outside is the greatest. Choose a cool, windy day in the fall or a cold winter day. Run all exhaust fans and turn on the furnace to increase the pressure difference.

Move your draft indicator around door and window edges, electrical outlets and other potential leakage areas and mark drafty spots with chalk.

Check the drafty areas to see if there is weatherstripping, if it is worn out and should be replaced, or if it just needs adjusting.

Use the work plan (page 14) to record results. Based on information in the following sections choose appropriate materials, prepare the surface properly and install the weatherstripping correctly.

Surface Preparation

A properly prepared surface is essential for weatherstripping to provide an effective, long-lasting seal.

Surface preparation involves several quick and easy steps. Materials to be weatherstripped should be thoroughly cleaned to remove dirt, oil, grease, flaking paint, wood splinters, etc. Uneven surfaces should be levelled with a hand plane or sander. Major gaps or cracks should be filled with a latex wood filler.

Before weatherstripping windows and doors, any major structural flaws (warped frames, missing stops, etc.) should be repaired or trued. For adhesive-backed weatherstrips, the surface should be completely dry before application.

Application of Weatherstripping

Most weatherstripping can be easily installed with the use of standard tools such as a hammer, screwdriver, staple gun and hacksaw.

Weatherstripping can be installed throughout the year, but temperature will affect the installation of certain materials. In some cases, weatherstripping installed during warmer months may have to be adjusted to maintain a good seal when sub-zero temperatures are encountered.

As a general rule, adhesive materials used in weatherstripping products are not affected by extremes in temperature. However, while most adhesive-backed materials are meant to be installed without additional fastening, it is advisable to reinforce the seal with staples every 150 mm (6 in.).

Weatherstripping should be installed in continuous pieces with a minimum of splices. Materials should butt tightly at corners. If there are gaps in the weatherstripping, seal them with caulking.

If there is a possibility of air leakage through the gap between the weatherstripping and the surface it is applied to, apply a small bead of caulking under or against the weatherstripping.

Jamb Weatherstripping for Doors and Windows

Different weatherstripping materials are described in Table 1. The types used for windows and the sides and tops of doors are described here.

Tubular weatherstripping provides one of the best seals. However, on doors or swinging windows, it requires the most closing pressure, important if the users are children, handicapped or elderly. Vinyl strips are better for their use.

Felt and open-cell foam strips must be tightly compressed to create an adequate seal. They keep out dust, but are inadequate as air barriers. This publication concentrates on weatherstripping materials made of vinyl, rubber, EPDM, neoprene and other durable airtight materials.

The type of window has a direct bearing on the weatherstripping to use. Double hung or vertically sliding windows, common in homes 20 to 30 years old, can be weatherstripped with tubular or strip materials (Figure 3). The permanent or non-sliding sections should be caulked to eliminate air leaks.

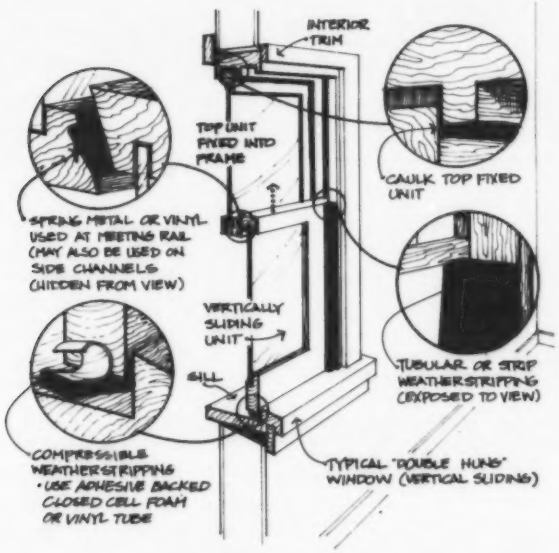

INTERIOR TRIM
TOP UNIT FIXED INTO FRAME
CAULK TOP FIXED UNIT
SPRING METAL OR VINYL USED AT MEETING RAIL (MAY ALSO BE USED ON SIDE CHANNELS (HIDDEN FROM VIEW)
VERTICALLY SLIDING UNIT
SILL
TUBULAR OR STRIP WEATHERSTRIPPING (EXPOSED TO VIEW)
COMPRESSIBLE WEATHERSTRIPPING • USE ADHESIVE BACKED CLOSED CELL FOAM OR VINYL TUBE
TYPICAL "DOUBLE HUNG" WINDOW (VERTICAL SLIDING)

Figure 3

Spring metal is the most durable but is difficult to install on existing windows. Tubular or vinyl strips can be mounted inside, but in this extreme climate will last longer on the inside. It is best to use a tension strip on the meeting rails in the centre of vertical sliders.

Horizontal sliders are common and include sliding glass doors. Ease of application depends on the type of sash. If not previously weatherstripped, wood or vinyl-covered wood windows are usually best fitted with tubular or angled strip materials (Figure 4). If present weatherstripping is worn out, replace it with a similar type.

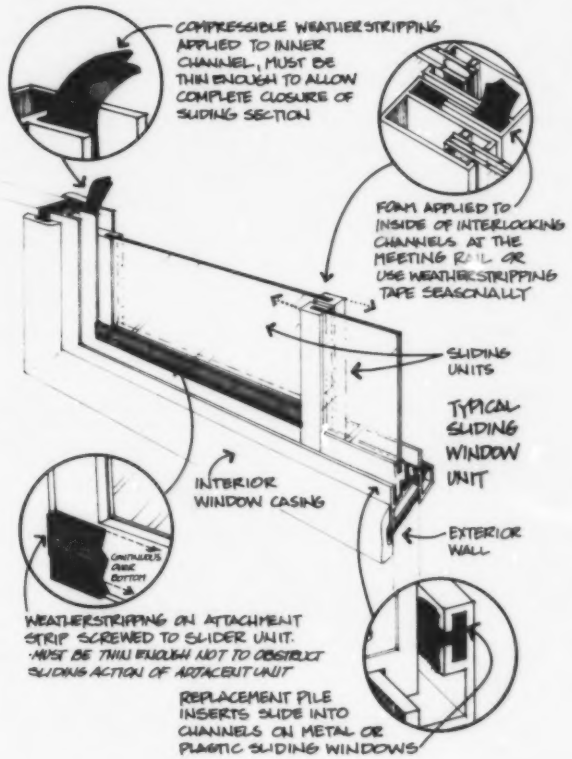
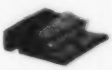

COMPRESSIBLE WEATHERSTRIPPING APPLIED TO INNER CHANNEL, MUST BE THIN ENOUGH TO ALLOW COMPLETE CLOSURE OF SLIDING SECTION
FOAM APPLIED TO INSIDE OF INTERLOCKING CHANNELS AT THE MEETING RAIL OR USE WEATHERSTRIPPING TAPE SEASONALLY
SLIDING UNITS
TYPICAL SLIDING WINDOW UNIT
INTERIOR WINDOW CASING
EXTERIOR WALL
WEATHERSTRIPPING ON ATTACHMENT STRIP SCREWED TO SLIDER UNIT. • MUST BE THIN ENOUGH NOT TO OBSTRUCT SLIDING ACTION OF ADJACENT UNIT
REPLACEMENT PILE INSERTS SLIDE INTO CHANNELS ON METAL OR PLASTIC SLIDING WINDOWS

Figure 4

Metal or vinyl sash horizontal sliders are usually weatherstripped at the factory. However, if worn or defective, the seals can usually be replaced by sliding new material into the channels (Figure 4). Be sure to measure the width in order to purchase the correct size.

Table 1
Weatherstripping Materials

Design	Type	Comments
Tape	Cloth or plastic	• Use on non-opening window, door • Good for one season • Quick, easy to install • Remains in full view • May remove paint when peeled off
	Foam, Adhesive	• Use on windows, doors, attic hatch for compression fit • Available in open- or closed-cell types • Closed cell more durable • Quick, easy to install • Hidden from view
	EPDM rubber, adhesive	• Use on windows, doors for compression fit • Good durability, air seal • Quick, easy to install • Hidden from view
Gasket	Tubular, Core filled	• Use on windows, doors • Good durability, air seal • Must be nailed & stapled or screwed in full view • Made with rubber, plastic or vinyl • Difficult to compress • Some with adjustable metal attachment
	Tubular Hollow	• Use on windows, doors • Good durability, air seal • Must be nailed & stapled or screwed in full view • Made with rubber or vinyl • Some with adjustable metal attachment
	Hollow on attachment strip	• Use on windows, doors • Good durability, air seal • Usually nailed or screwed in full view • Slotted holes allow re-adjustment • Made of rubber or vinyl with aluminum or vinyl attachment strips

Design	Type	Comments
Strip	Tension (spring metal or v-strip)	• Use on windows, doors; especially for gap where sash of double hung window meets • Excellent durability, good seal • Usually made of metal (bronze) or vinyl • Must be nailed if metal, or adhesive • If vinyl, invisible when installed • Hidden from view • Double strip vinyl available for better seal
	Pile or Fin on attachment	• Use on sliding windows, doors • Moderate to good seal, durability • Must be nailed or screwed in full view • Made with vinyl, rubber or polyester pile with fin seal on wood, vinyl or aluminum attachment strip
	Foam on attachment strip	• Use on windows, doors for compression fit • More durable than adhesive type • Must be nailed or screwed • Hidden from view • Closed cell is more durable
Specialty 	Spring loaded	• Use on windows, doors • Excellent durability and seal • Must be nailed or screwed • Made with aluminum or vinyl • Self-adjusting
	Magnetic Strip	• Use on windows, doors • Excellent durability and seal • Must be nailed or screwed • Made with aluminum and vinyl

Because there is such a variety of sliding windows, some innovation may be necessary. For sliding windows or doors with large, leaky gaps, seal the channels with polyethylene backer rod or seal-and-peel caulking (see elastomeric caulking in Table 3) in the fall and remove it in the spring. For narrower gaps, apply cloth or plastic tape in the fall and remove in the spring.

Awning, hopper or casement windows that swing open can be weatherstripped in the same way as doors. Material is attached to the jamb and the door or window closes against it. Figure 5 shows types of jamb weatherstripping suitable for doors or swinging windows. Weatherstrip all sides, including the hinge side.

Most windows of this type are factory weatherstripped, but if the materials wear out, replace with similar types. Select a material with slotted holes or one that is self-adjusting to accommodate slight movement, warping or shrinkage.

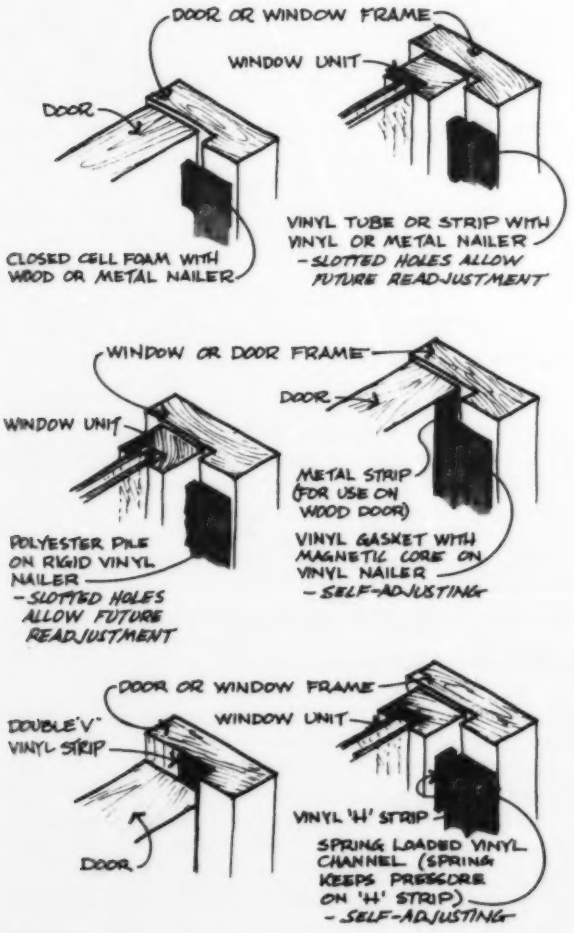

DOOR OR WINDOW FRAME
WINDOW UNIT
DOOR
VINYL TUBE OR STRIP WITH VINYL OR METAL NAILER
- SLOTTED HOLES ALLOW FUTURE READJUSTMENT
CLOSED CELL FOAM WITH WOOD OR METAL NAILER
WINDOW OR DOOR FRAME
DOOR
WINDOW UNIT
METAL STRIP (FOR USE ON WOOD DOOR)
VINYL GASKET WITH MAGNETIC CORE ON VINYL NAILER
- SELF-ADJUSTING
POLYESTER PILE ON RIGID VINYL NAILER
- SLOTTED HOLES ALLOW FUTURE READJUSTMENT
DOOR OR WINDOW FRAME
DOUBLE 'V' VINYL STRIP
WINDOW UNIT
VINYL 'H' STRIP
DOOR
SPRING LOADED VINYL CHANNEL (SPRING KEEPS PRESSURE ON 'H' STRIP)
- SELF-ADJUSTING

Figure 5

New windows often have double weatherstripping, that is, two separate seals. This concept can be used when upgrading windows. For swinging windows, put one strip on the edge of the sash that moves and another compression strip on the jamb on the inside.

For a better seal clean surface and apply a bead of caulk under the weatherstripping where it attaches to the flat surface.

Weatherstripping the Bottoms of Doors

The bottoms of doors, unlike jambs, have traffic wear and must be more durable. There are two ways to weatherstrip: using a threshold or attaching a door bottom or sweep (Table 2).

Try to choose a threshold or door bottom that does not require trimming the door. Some will adjust to accommodate different clearances (Figure 6), but others will not. Door sweeps require no clearance, because they attach to the side of the door.

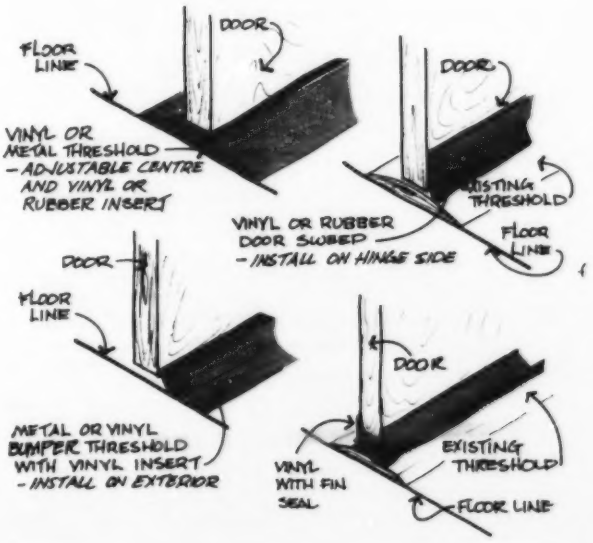


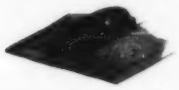
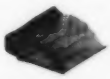
Figure 6

Thresholds are generally installed to replace worn out ones. Often only the vinyl or rubber weatherstripping is defective, not the entire assembly. Determine if new inserts can be purchased separately. If the whole threshold must be replaced, select one with replaceable gaskets.

Door bottoms or sweeps are usually installed on doors with no existing bottom weatherstripping. They are installed flush with the floor of the existing sill to provide a positive seal against air movement. Select a sweep or door bottom that can be adjusted to compensate for wear and movement.

Table 2

Weatherstripping Door Bottoms

Type	Comments
Saddle Threshold 	• Requires minimum clearance of 15 mm (⅝ in.) • May have adjustable insert up to 30 mm (1¼ in.) • Check that replacement gaskets are available • Fair to good durability • Good seal • Made with vinyl or rubber and an aluminum base • Installed with screws
Bumper Threshold 	• Bottom clearance not required • Can be damaged by trapped stones, traffic wear, etc. • Check that replacement gaskets are available • Good seal if regularly swept • Fair to good durability • Made with vinyl or rubber on a vinyl, wood or aluminum attachment • Installed with screws on exterior of door
Door Bottom	• Requires minimum clearance of 8 to 13 mm (¼ to ½ in.) • Some types can also be used as a threshold • Check that replacement gaskets are available • Screwed into bottom; door must be removed for installation • Made with rubber, metal, vinyl or pile on an aluminum or vinyl base
Door Sweeps	• Good for uneven floors • Adjustable; some adjust automatically for sweeping over deep carpeting • Easy to attach; may be adhesive-backed, nailed or screwed • Attach to inside face on in-swinging door or outside of out-swinging door • Fair to good durability and seal, depending on material used • Made with vinyl, rubber or polyester pile on an aluminum, vinyl or wood attachment strip

Weatherstripping for Other Openings

Other "door-type" openings include attic hatches and milk chutes. Milk chute doors can be weatherstripped with the same materials as windows and doors. If the chute is not in use, fill the box with insulation and seal the inside door with caulking.

Attic access hatches should be weatherstripped with compressible tube or strip products installed as shown in Figure 7. If the hatch is too light for a tight seal, add fasteners or screw the hatch securely closed. The hatch must also be adequately insulated.

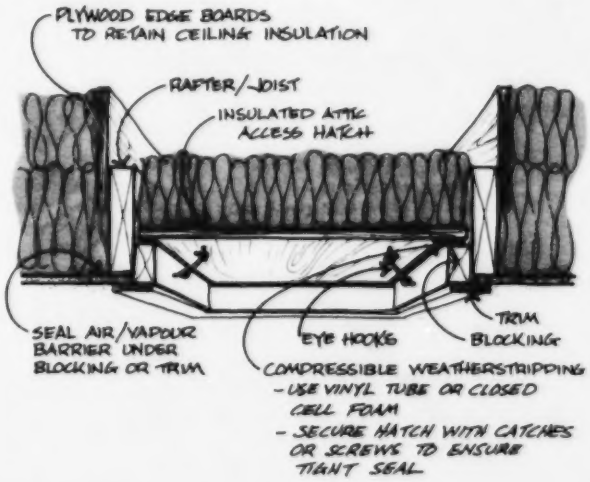

PLYWOOD EDGE BOARDS TO RETAIN CEILING INSULATION
RAFTER/JOIST
INSULATED ATTIC ACCESS HATCH
SEAL AIR/VAPOUR BARRIER UNDER BLOCKING OR TRIM
EYE HOOKS
TRIM BLOCKING
COMPRESSIBLE WEATHERSTRIPPING
- USE VINYL TUBE OR CLOSED CELL FOAM
- SECURE HATCH WITH CATCHES OR SCREWS TO ENSURE TIGHT SEAL

Figure 7

Other "doors" to the exterior include exhaust fan dampers. These cannot be weatherstripped. Make sure they are closed when not in use by feeling for backdrafts. A dust or lint buildup around the closing flap or a bent sticking hinge can prevent the flap from closing completely. Clean and adjust the dampers to correct this. The duct that runs from the clothes dryer should be cleaned regularly to prevent a lint buildup around the damper.

The fireplace chimney damper should fit tightly. Use a light and check for gaps caused by debris buildup, warping or poor construction. The damper cannot be weatherstripped but can be cleaned or adjusted for a better fit. An alternative would be to install a new damper on top of the chimney. Consider plugging the chimney opening in winter, or permanently if the fireplace is not used. A decorative, insulated fireplace "plug" can be inserted into the cold firebox opening (Figure 8). The plug will prevent heated room air from constantly rising up the fireplace chimney around a poorly fitting damper.

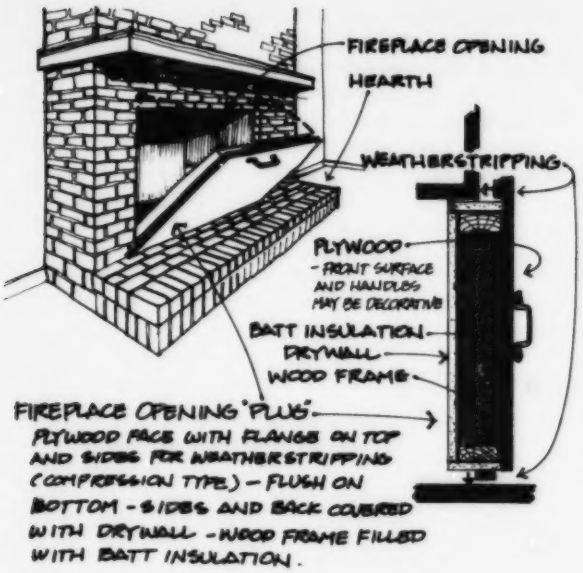

FIREPLACE OPENING
HEARTH
WEATHERSTRIPPING
PLYWOOD
- FRONT SURFACE AND HANDLES MAY BE DECORATIVE
BATT INSULATION
DRYWALL
WOOD FRAME
FIREPLACE OPENING "PLUG"
PLYWOOD FACE WITH FLANGES ON TOP AND SIDES FOR WEATHERSTRIPPING (COMPRESSION TYPE) - FLUSH ON BOTTOM - SIDES AND BACK COVERED WITH DRYWALL - WOOD FRAME FILLED WITH BATT INSULATION.

Figure 8

Caulking

Caulking is applied where two surfaces meet but do not move, such as sill plates or duct outlets. Applying caulking requires a little more effort and skill than weatherstripping. Some areas such as plumbing stacks, chimneys or electrical outlets require specialized or combination weatherstripping and caulking techniques.

Houses are built of a number of different materials. Because the materials expand and contract at different rates with temperature and moisture changes, cracks and gaps can occur. Exterior gaps are a concern because water can penetrate and cause deterioration, interior gaps because air leakage causes heat loss and heated air carries moisture which may condense in the wall and cause damage.

The best place to seal with caulking is on the inside, to prevent moisture accumulating in wall and ceiling cavities. Interior sealants, though not subject to the same severe weather conditions as exterior types, should be chosen for their ability to maintain a good degree of flexibility and adhesion over a long period of time.

The preferred interior sealant will depend on its use. Factors to consider include whether the sealant will be exposed or concealed, the width of gap, types of adjacent materials and whether a high degree of flexibility is required. Table 3 shows the characteristics of caulking materials.

The most common and easiest form of caulking to use comes in 310 ml (11-oz.) tubes and is applied by using a standard caulking gun. As shown in Figure 9, large-sized tubes are also available.

Figure 9

Before using caulking:

- Remove old caulking completely.
- Make sure all surfaces are dry and free of dirt, loose materials, grease or oil. Do not apply caulking at temperatures below 10^0C (50^0F) unless otherwise specified on label.
- Always read the label. See if the caulking is flammable, irritating to the skin, or gives off dangerous vapours, and handle it accordingly.
- If priming is required, paint two light coats of alcohol shellac or a primer recommended by the manufacturer.
- Choose caulking suitable to the size of crack to be filled and compatible with the materials it is to adhere to. Large cracks, deeper or wider than 12 mm (½ in.) should be filled first with backing material, such as closed-cell polyethylene foam (called backer rod) or oakum.
- Tape edges of the crack to keep caulking off adjoining surfaces.

Table 3

Types of Caulking

Type	Comments
Oil/resin base	• Durable for one or two years • Forms hard surface when dry, cracks
Latex base (acrylic or non-acrylic)	• Durable for 10 to 20 years • Acrylic has better adhesion and is more durable than non-acrylic • Bonds well to porous surfaces such as wood or concrete but not to metal • Easy to apply, does not require primer • Do not use in constant-moisture environments (showers) as susceptible to mildew • Cures in three days • Forms hard or flexible surface when dry; use for small movement joints between similar materials • Can be painted; available in colors • Some types clean with water, or use paint thinner
Butyl rubber	• Durable for five to 15 years • Bonds well to all surfaces but tends to shrink • Does not require primer • More difficult to apply than latex • Can degrade in sunlight • Cures in seven days • Flexible when dry; use for small movement joints • Clean with paint thinner • Can be painted; available in colors
Elastomeric (silicone, polysulphide)	• Durable for more than 20 years • Bonds to most surfaces • Requires primer for some plastics, masonry and other porous material (specialized sealants are available) • Won't seal over itself without a primer • Difficult to apply in cold weather • High moisture resistance • Silicone cures in five days, polysulphide in 30 • Non-toxic when cured • Temporary types available that can be peeled off • Little shrinkage; remains flexible when dry; use for large movement joints • Needs special cleaners for tools and hands
Polyurethane Foam	• Available in aerosol can • Specialized product for large gaps • Requires care in applying, expands 2½ times • Bonds to most surfaces • Requires a primer before use on pressure-treated wood or vinyl • Tack free in hours, final cure 8 days • Flammable (must be covered with drywall on interior) • High insulation value
Acoustical sealant	• Durable for more than 20 years • Interior use only • Excellent for air/vapour barrier joining • Easy to apply but messy • Non-hardening (must be covered) • Clean with paint thinner
Rope or cord	• Specialized product for larger gaps, best choices are ethafoam rope and polyethelyne backer rod • Can be used temporarily; removed for re-use, if not sealed • Should be protected by sealant or covering

Note: There are many caulking types available, some combine those described here. Read the label for proper use and application.

Practice may be required to make a neat, uniform bead when using a caulking gun. The nozzle should be cut at a 45^0 angle. Because the nozzle is tapered, cut it at the point that will give the required width -- near the narrow end for a small bead, farther up for a wider bead. The caulking material should be pushed out the nozzle as steady pressure is applied. Hold the angle of the gun constant and move ahead at an even rate. The resulting "bead" should provide a good seal. Be careful to leave enough caulking to accommodate shrinkage or joint movement (Figure 10).

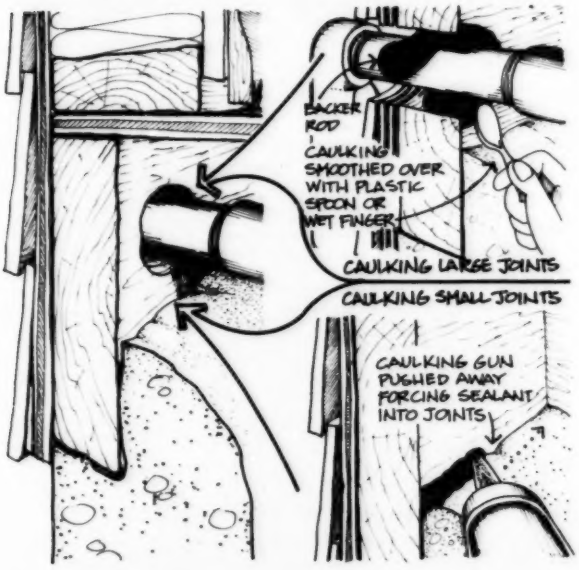

BACKER ROD
CAULKING SMOOTHED OVER WITH PLASTIC SPOON OR WET FINGER
CAULKING LARGE JOINTS
CAULKING SMALL JOINTS
CAULKING GUN PUSHED AWAY FORCING SEALANT INTO JOINTS

Figure 10

Smooth the bead with a wet finger or use a plastic spoon for toxic caulking such as silicone or oil-based. Remember to release the pressure on the plunger after each run or you will get messy drips.

For gaps larger than 9 mm (3/8 inch) in width or depth, polyurethane foam can be used. Other caulks require a backer material such as rope caulking or foam weatherstripping to reduce depth. Most caulking will crack if it does not have three point contact (two sides and behind).

When finished, seal the tip of the caulking gun tightly after cleaning out excess caulking. Shelf life for most unopened caulking is two years. For immediate clean up, use water for silicone and acrylic latex caulking. For other caulking try a standard solvent like rubbing alcohol, lacquer thinner or spirits.

Sealing the Joist Space

The exposed section of foundation walls and the joist space have cracks and openings, resulting in a high rate of air movement. It is easier to seal the joist space from inside. Figure 11 shows how the sill plate and joists can be caulked. A good quality caulking for this area is acrylic. Be sure to seal inside and outside service pipes, ducts or conduits that go through the walls or end joists. Large gaps should be tightly stuffed with rope caulking or filled with expanding foam as a backing for caulking (Figure 12). Use good quality, durable caulking material because it may be covered when you insulate the joist space. Elastomeric caulks suitable for concrete application give the best service.

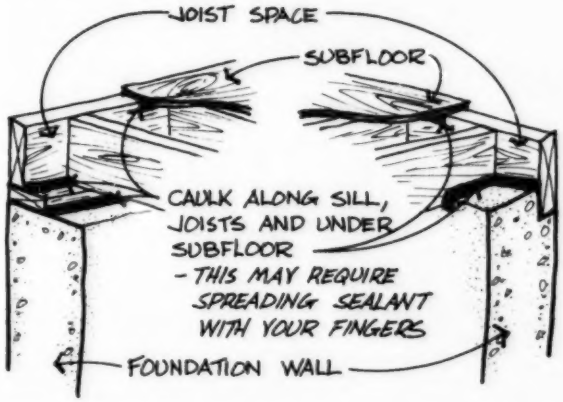

JOIST SPACE
SUBFLOOR
CAULK ALONG SILL, JOISTS AND UNDER SUBFLOOR
- THIS MAY REQUIRE SPREADING SEALANT WITH YOUR FINGERS
FOUNDATION WALL

Figure 11

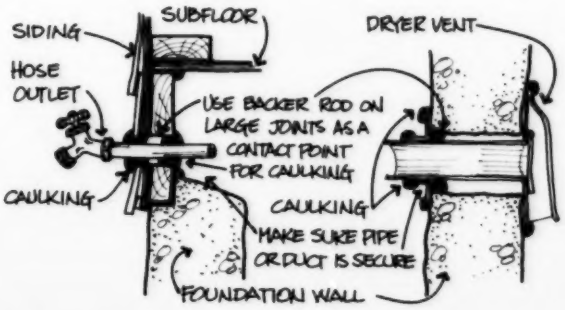


Figure 12

Sealing the Attic Space

If the attic has a vapour barrier, cracks around pipes, vents and chimneys or along partitions between the warm living space and cool attic must be plugged to stop air leakage (Figures 13 and 14). Plywood "collars", neoprene roof flashing or polyethylene fit snugly around plumbing and vents. The material must be secured and caulked to the pipe and existing vapour barrier.

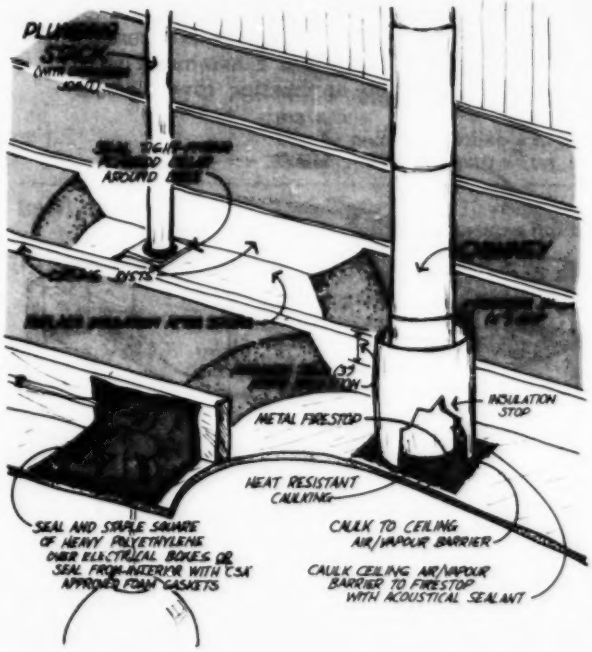

CEILING JOISTS
METAL FIRESTOP
INSULATION STOP
HEAT RESISTANT CAULKING
SEAL AND STAPLE SQUARE OF HEAVY POLYETHYLENE OVER ELECTRICAL BOXES, OR SEAL FROM INTERIOR WITH C.S.A. APPROVED FOAM GASKETS
CAULK TO CEILING AIR/VAPOUR BARRIER
CAULK CEILING AIR/VAPOUR BARRIER TO FIRESTOP WITH ACOUSTICAL SEALANT

Figure 13

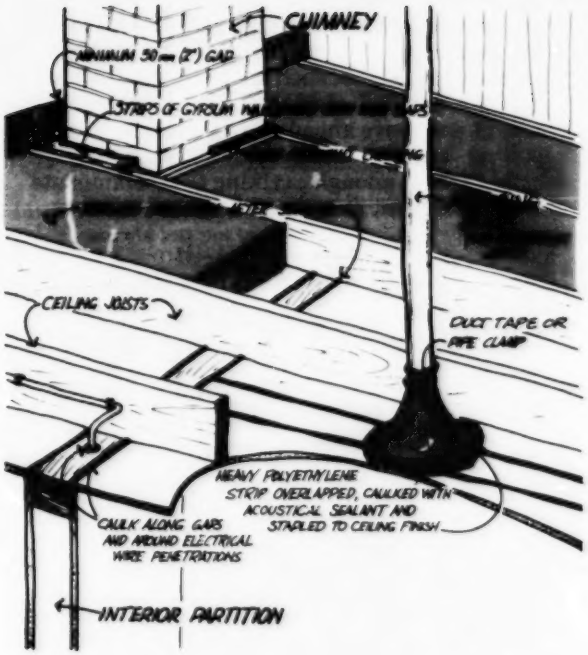

CHIMNEY
CEILING JOISTS
DUCT TAPE OR PIPE CLAMP
HEAVY POLYETHYLENE STRIP OVERLAPPED, CAULKED WITH ACOUSTICAL SEALANT AND STAPLED TO CEILING FINISH
CAULK ALONG GABS AND AROUND ELECTRICAL WIRE PENETRATIONS
INTERIOR PARTITION

Figure 14

Metal firestops must be used around metal chimneys. The metal must be sealed to the vapour barrier. Do not use a normal caulking material but use heat-resistant "muffler cement" to seal the firestops to the chimney metal. Strips of gypsum wallboard sealed with heat-resistant caulking can be used around masonry chimneys.

Improve the vapour barrier over ceiling electrical boxes by placing an additional piece of polyethylene over these areas.

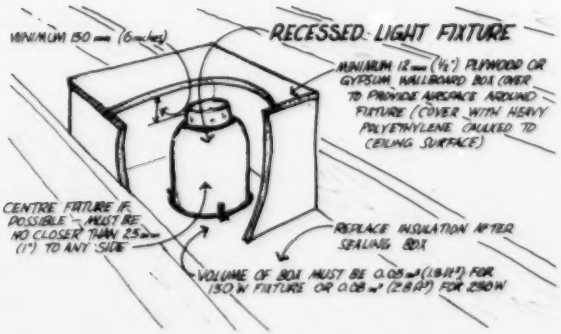

RECESSED LIGHT FIXTURE
MINIMUM 12 mm (½") PLYWOOD OR GYPSUM WALLBOARD BOX COVER TO PROVIDE AIRSPACE AROUND FIXTURE (COVER WITH HEAVY POLYETHYLENE CAULKED TO CEILING SURFACE)
CENTRE FIXTURE IF POSSIBLE — MUST BE NO CLOSER THAN 25 mm (1") TO ANY SIDE
REPLACE INSULATION AFTER SEALING BOX
VOLUME OF BOX MUST BE 0.03 m³ (1.0 ft³) FOR 150 W FIXTURE OR 0.08 m³ (2.8 ft³) FOR 250 W

Figure 15

Recessed lights must have adequate air space around them. Figure 15 is the accepted method of sealing and insulating around such fixtures.

Be sure to disconnect the circuits in the areas of work. Try to caulk the points where electrical wires penetrate the open plates of walls.

Before leaving the attic, replace insulation in all areas where it was disturbed. **Do not place insulation within 50 mm (2 inches) of chimneys.**

Sealing Around Window and Door Openings

The installation space or rough opening around windows and doors is a major area of air leakage. Usually insulation has been stuffed into the crack. This insulates but does not stop the air flow. This leakage can be stopped with methods shown in Figure 16.

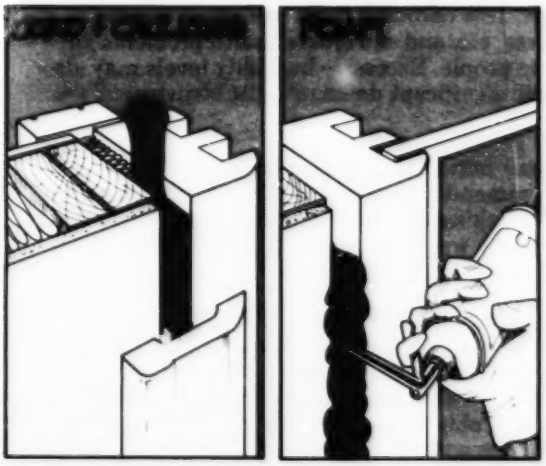


Figure 16

It is convenient to improve the seal around doors and windows of older homes when the trims are removed for repainting or are being replaced.

Sealing Loose Panes of Glass

If glass panes are loose in their wood frames, new caulking is required to stop air leakage. Putty compounds are often used and are the least expensive solution. Clean off the old material before reglazing. *Windows* discusses this method in detail. Air leakage around sealed units and their frames can be stopped by using a cartridge-type caulking material (Figure 17). Remove the window trim and lay a bead of caulking along the bottom of the sealed unit. Replace the trim.

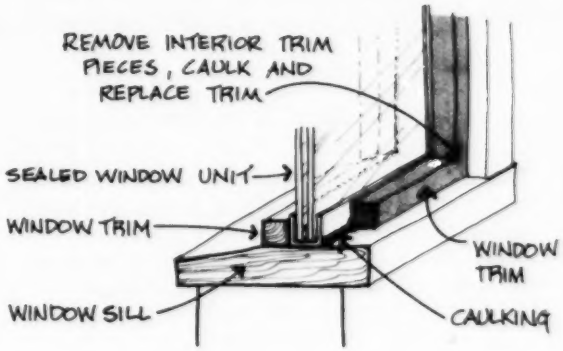


Figure 17

Glass panes in metal and vinyl frames are sealed with vinyl strips. The strips are durable and should not require replacement during the life of the window.

Work Plan*

Area	Feature	Description
Basement	Windows	Caulk around window frame
	Windows	Replace weatherstripping
	Sill plate	Caulk between floor joists and concrete
	Clothes dryer vent	Caulk around vent
	Clothes dryer vent	Make sure vent flap seals properly
	Fresh air duct	Caulk around duct
	Electric service cable	Caulk around cable
	Telephone cable	Caulk around cable
	Outside faucet	Caulk around faucet
	Cable TV	Caulk around cable
Walls	Outlets, switches	Install gaskets behind plates, safety plugs
	Windows	Caulk around window frame
	Windows	Replace weatherstripping
	Doors	Caulk around door frame
	Doors	Replace weatherstripping
	Fireplace	Install glass doors, "plug", chimney top damper
	Fireplace	Check damper for proper seal
	Baseboards	Remove and caulk behind
	Milk Chute	Stuff with insulation and caulk
	Ventilation fans	Caulk around outside edge
	Mail slot	Check for seal
Ceiling	Attic hatch	Weatherstrip around perimeter
	Plumbing stack	Install vapour barrier and caulk
	Bathroom vent	Caulk around outside edge
	Kitchen vent	Caulk around outside edge
	Recessed lights	Install vapour barrier and caulk
	Chimney	Install metal collar and caulk
	Electric wire penetrations	Caulk

This work plan is designed to help you detect air leakage areas and to record materials required. Take this work plan with a draft detector and tape measure around your house and test for air leakage points. Using the tables in this book, record the materials required. Take the book with you to your local hardware and building supply store. Remember to test your house on a day when drafts will be greatest (i.e. cold and/or windy).

Materials: Types, Quantity	Tested	Sealed

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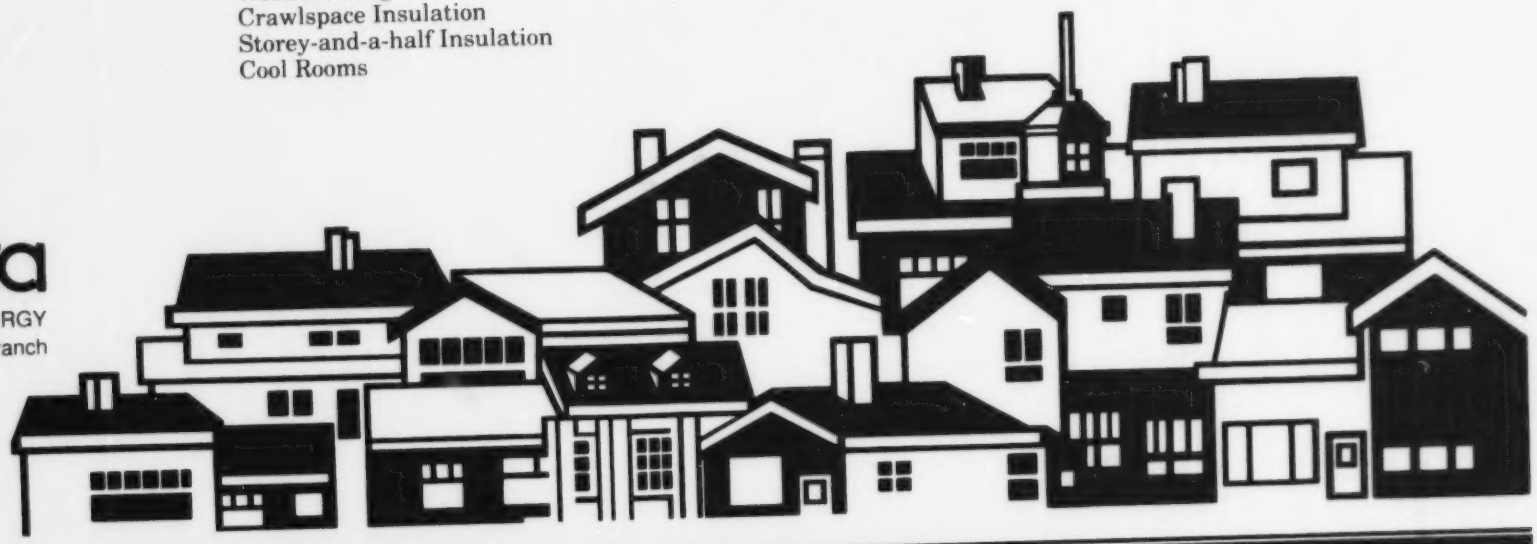

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